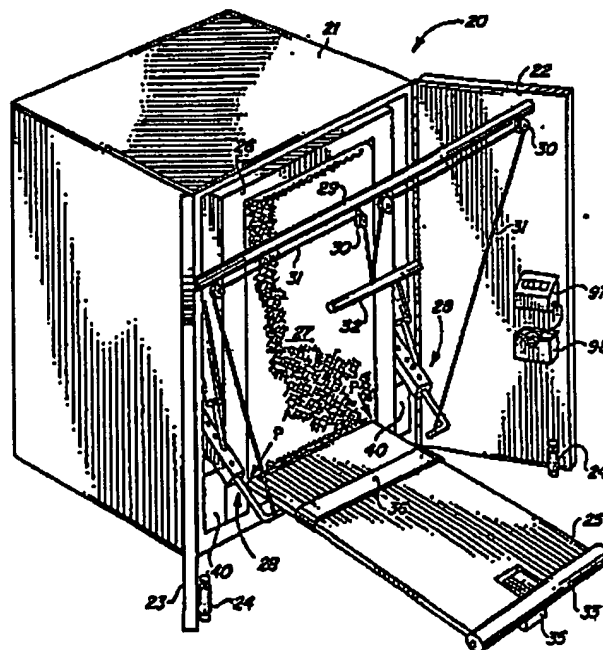


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(54) Title: MULTIPLE DEVICE EXERCISE SYSTEM**(57) Abstract**

An exercise system utilizes a common linear structural element (38) which makes possible the incorporation of a multiplicity of exercise devices as part of the exercise system housed within a cabinet (21) or readily storable in a closet. The structural element (38) comprises an extrusion with a plurality of longitudinal channels (A through G) thereabout for accepting wheels (41), slide or locking plates (57) or similar devices for coupling various exercise devices to the structural element. The variety and multiplicity of such linear channels permits a dynamic relationship to exist among an infinite number of positioning points of coupling of the various exercise elements to the structural element. The problem that has existed is that home exercise equipments do not lend themselves to interrelating a large plurality of exercise devices. This problem has been overcome by the claimed invention which may be connected into a large number of exercise devices, and be stored in a cabinet.



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-1-

MULTIPLE DEVICE EXERCISE SYSTEM

DESCRIPTION

Technical Field

The invention relates to the field of exercise devices, particularly those suited for use within the home. The invention relates to a cabinet enclosed exercise system, the cabinet blending with the interior decor of the home, housing the exercise devices making up the system when the system is not in use, and acting to partially support the various exercise devices of the system while the system is in use.

Background Art

More and more people are concerned with physical fitness. Health clubs with exercise machines, aerobic exercises, swimming and the like abound. Such clubs are costly and often crowded. While the desire to remain fit is on the rise, modesty and the annoyance with crowded places causes many people to look for other, more effective ways to workout. As a result, the home-exercise industry has topped the billion dollar a year mark in the United States and shows no sign of slowing.

In-home exercise equipment ranges from things as simple as jump ropes and small hand-held weights to gravity-inversion systems and multi-function gym units which cost as much or more than \$3,000.00. The big question for the in-home exerciser is where, in the home environment, is the best place to exercise. The weather often prohibits the use of the equipment on porch or patio. The indoor environment can be better controlled, but the location of the equipment within the home then becomes important. Few people have a room that can be devoted exclusively to exercise. Most residential bedrooms are too small to house both a suite of furniture and exercise equipment as well. Such devices usually find their way into the family room or living room of

-2-

the home where they clash with the decor and impose themselves upon the family's living space..

The potential of the home exercise system to present itself as an eyesore is well recognized. The prior art abounds with cabinets for housing exercising equipment. Most such cabinets are intended to hide such clutter of bar bells, dumb bells, and cord and pulley exercise devices. The variety of exercisers available for use with such a cabinet housed exercise system has generally been limited. Attempts to house a great variety of exercise devices within an attractive cabinet have met with very limited success because of the complexity of assembling a plurality of exercise devices in a manner which permits the dynamic interaction of these devices while maintaining the overall cost of such exercise system at a reasonable level. Prior art cabinet housed exercise systems, in general, do not lend themselves to dynamically interrelating a great plurality of exercise devices primarily because of the limitations of the structural elements of which the prior art systems are made. Simple cylindrical or rectangular tubular structural elements are limited in their ability to support several moving elements such that the relative positions of the elements may be readily changed one with respect to the other without interference of one with another.

It is an objective of the present invention to provide a cabinet housed exercise system which will complement the decor of the home and impose itself minimally upon the living space of the home when the exercise system is not in use.

It a further objective of the invention to provide a cabinet housed exercise system which houses a multiplicity of exercise devices without the structural constraints imposed upon prior art systems.

It is another objective of the invention to provide a cabinet housing a plurality of exercise devices in dynamic

-3-

interrelationship by use as a coupling device which permits the non-interfering longitudinal displacement of the points which a plurality of such exercise devices are coupled to the structural element.

Disclosure of the Invention

The invention is an improvement in exercise systems which house a plurality of exercise devices within a cabinet which houses and supports the various devices. The improvement is a common lineal structural element which has a plurality of longitudinally disposed channels each communicating with the exterior element so as to allow each channel to accept one or more wheels or slide plates or locking plates. By placement of such elements within the various channels, the common structural element is employed as a coupling device which permits the cooperative assembly of a plurality of exercise equipment and which permits that equipment to be efficiently housed within the cabinet. Importantly, the plurality of longitudinally disposed channels permits the non-interfering longitudinal displacement of the points at which several of the exercise devices are coupled to any one given structural element.

When a framework is made up of two or more lengths of the common structural element, the plurality of channels permits devices to be slidably or fixedly coupled across the interior of the frame, or astraddle the frame when coupling is made to the exterior channels at the opposing outer walls of the frame. Channels in the top and bottom surfaces of the frame as well as in the inside and nominal outside walls of the frame may all be used to achieve fixed or slide coupling of exercise elements to the frame.

As disclosed herein, such a frame may be used to couple a treadmill exercise device thereto as well as a weight bench, hydraulic system to simulate weight exercises, and pulley and cord exercise devices. A second frame may be employed in the assembling of a collapsible bicycle frame.

-4-

The first frame may be used in conjunction with the bicycle frame permitting the bicycle exerciser to drive idler wheels supported by the first frame or to drive or be driven by the treadmill coupled to the first frame.

If the first frame is provided with a central longitudinal beam so as to provide two rectangular and parallel voids therein the first frame may be provided with ski pads which are slidably coupled one each within one of the parallel voids. Thus, a ski-type exercise may be performed in association with the ski pads and the hydraulic resistance units.

The common structural element disclosed herein is an extrusion having, for example, seven channels about its periphery which channels may be employed for coupling wheels, slide plate and locking plates thereto.

Brief Description of Drawings

Fig 1. is a perspective view of an exercise cabinet with doors ajar, weight bench, chinning bar and lateral bar disposed for use, with treadmill and coupling frame in storage position.

Fig. 2 is a perspective view illustrating coupling of exercise cord pulleys to coupling frame and hydraulic weight simulators and leg lift exercise extension of weight bench.

Fig. 3 illustrates in perspective detail, the extrusion element which facilitates housing a multiplicity of exercise devices within a single cabinet.

Fig. 4 is an end elevation view of the coupling frame indicating the positions of the treadmill and weight bench therein.

Fig. 5 is a perspective view of the coupling frame withdrawn from the cabinet and with treadmill positioned for use with hydraulic weight/resistance simulators.

Fig. 6 is a perspective illustration of an alternate embodiment of the coupling frame with a central beam to

-5-

accommodate coupling of ski pads to the coupling frame. The use of the frame as a rowing exerciser with either embodiment, is also illustrated.

Fig. 7 is a side elevation of the coupling frame showing details of the hydraulic weight simulators and manner in which frame and simulator may be stowed in cabinet or positioned for use with weight lifting exercises and weight bench.

Fig. 8 is an end elevation of the coupling frame and weight simulators showing pivoting of simulator handles to accommodate skiing, rowing or cord associated exercises.

Fig. 9 is a cross sectional view of a segment of the coupling frame detailing the manner in which the treadmill idler roller is coupled to the frame.

Fig. 10 is a perspective view of the coupling of the rowing exerciser foot pad to the coupling frame.

Fig. 11 details the coupling of the seat of the rowing exerciser to the coupling frame.

Fig. 12 is a detail of the manner in which the hydraulic weight/resistance simulators are coupled to the coupling frame.

Fig. 13 details the adjustable coupling of pulleys to the coupling frame for use in cord associated exercisers.

Fig. 14 is a detail of the coupling of the ski pads to the coupling frame.

Fig. 15 is a perspective of the ski pad.

Fig. 16 is a side elevation of the bicycle exerciser storable with the cabinet.

Fig. 17 is a plan view of the bicycle in its folded, storable configuration.

Fig. 18 is a side sectional elevation of the exercise cabinet with exercise devices stored therein.

Best Mode for Carrying Out The Invention

For the purposes of promoting an understanding of the principles of the invention, reference will now be made

-6-

to the embodiments illustrated in the drawings and specific language will be used to describe the same. It will, nevertheless, be understood that no limitation of the scope of the invention is thereby intended, such alterations and further modifications in the illustrated device, and such further applications of the principles of the invention as illustrated therein being contemplated as would normally occur to one skilled in the art to which the invention relates.

The drawings of the invention illustrated here are not scale drawings. In certain of the perspective views, the cabinetry and framework is presented as broader or having greater depth than in actual fact. This is brought about by the desire to clearly present details to enable those skilled in the art to readily understand the disclosure of the invention. Thus the drawings are prepared for conceptual communication rather than pictorial exactness. The invention 20 is presented in perspective view in Figure 1. A cabinet 21 houses a plurality of exercise devices. Cabinet doors 22 and 23 open outward to provide access to the various exercise devices and also act as support members to stabilize the cabinet when a person is employing certain of the exercise devices when they are extended outward from the cabinet. To this end floor contacting support units 24 are provided one at each of doors 22 and 23.

In Figure 1 is seen a weight-bench 25 which is pivotally coupled to a frame 26 at points P, the undersurface of treadmill 27 appears in Figure 1 housed within framework 26.

A chinning bar 29 maintains doors 22 and 23 in their open position at about a 45 degree angle with respect to the plane of the face of the cabinet 21. The bar 27 may be employed for chinning exercises and also supports pulleys 30 which communicate a resistance from hydraulic weight simulators 28 through cords 31 to exercise devices such as a lateral bar 32.

-7-

1
2 Weight bench 25 has a leg lift extension 33 which may
3 be extended as seen in Figure 2. Not shown but readily
4 conceived by those skilled in the prior art is a mechanism
5 which will limit the upward travel of leg lift extension
6 33 to the approximate conjunction of the plane of weight
7 bench 25. In withdrawing the leg lift extension from its
8 storage position, shown in Figure 1, the decision is made
9 to emplace the extension 33 above or below the plane of
10 weight bench 25. If emplaced above, the mechanism in ques-
11 tion will limit the downward travel of extension 33 so that it
12 cannot pass through the plane of weight bench 25.

13 Leg lift extension 33 may be coupled directly to
14 hydraulic lever weight simulators 28 or, as shown in Figure
15 2, cords 34 may be employed to communicate the resistance
16 provided by hydraulic lever units 28 to the leg lift
17 extension 33.

18 As will be disclosed in greater detail herein,
19 hydraulic lever assemblies 28 are lockingly slide coupled
20 to frame 26 so their longitudinal position on frame 26
21 may be selectively determined. Thus a person lying on
22 weight bench 25 may readily make use of the hydraulic lever
23 assemblies to perform weight pushes and weight pulls. Hand
24 rings 39 which communicate with hydraulic resistance lever
25 units 28 by means of cords 37 and pulleys 74 may be used
26 alone or in conjunction with weight bench 25. As will be
27 disclosed further in the discussion of Figure 7, hydraulic
28 resistance lever assemblies 28 are adjustable to provide a
29 range of resistance to suit the needs of the individual
30 utilizing the exercise system.

31 Weight bench 25 is provided with support leg 35.
32 Support leg 35 is foldable to permit convenient storage of
33 the weight bench 25 within frame 26 in cabinet 21. When
34 the weight bench 25 is extended in positions shown in Figures
35 1 and 2, and support leg is extended, weight bench 25 is
36 generally parallel to the floor in which cabinet 21 sits.
37 If support leg 35 is placed in its fold-down position, weight

-8-

bench 25 may be utilized as a slant board, in which case foot strap 36 is available to hold the legs and feet of the person performing exercises on the slant board.

A common lineal structural element is utilized to permit the incorporation of a multiplicity of exercisers within cabinet 21. This common structural element is an extrusion 38, a section of which is shown in perspective in Figure 3. Extrusion 38 is provided with a plurality of longitudinal disposed channels A through G which communicate with the exterior of extrusion 38. Within the channels may be incorporated wheels, slide plates, and locking plates so that a multiplicity of exercise devices may be coupled to structural element 38. Because of the configuration of extrusion 38 and the variety of channels therein, the points at which various exercise devices are coupled to element 38 may be selectively determined and adjusted each with respect to the others along a line parallel to the longitudinal axis of element 38. Thus each coupling point may be selectively disposed without interfering with other coupling points along the length of element 38. Frame 26 is comprised of four lengths of structural element 38 to provide a rectangular framework. As shown in Figure 2 and in somewhat greater detail in Figure 4, the treadmill 27 is coupled between interior opposing walls of frame 26. Idler rollers 41 are coupled to channels A of elements 38 in frame 26 as a rolling support for treadmill 27. Weight bench 25 is pivotally coupled within frame 26 in channels E of structural elements 38. When frame 26 is raised to the position shown in Figures 1 and 2, weight bench 25 may be pivoted upward for storage within frame 26.

Weight bench 25 is lockable, by conventional means, within its stored position within frame 26. This permits the lowering of frame 26 to the position as shown in Figure 5. When frame 26 is so lowered, treadmill 27 is available for use. An idler roller 41 at each end of treadmill 27, only one of which is shown here, provides rolling support for

-9-

1
2 treadmill belt 42. Between the two idler rollers 41 is a
3 support surface 99 with a low-friction coating thereon.
4 Such coating may comprise teflon or polypropylene. A driven
5 roller 43 in frictional contact with belt 42 provides the
6 necessary drive to treadmill belt 42. Drive motor 44 is
7 coupled by belt drive 45 to drive roller 43 as a primary mover
8 for treadmill 27. A variable speed control, housed in
9 electronic monitor in control box 97 on the door of cabinet
10 21, Figure 1, provides infinite variation in the speed of
11 drive motor 44 so that belt 42 may be driven at speeds
12 infinitely variable up to 10 m.p.h. Hydraulic lever resis-
13 tance assemblies 28 may be utilized by a person on the belt
14 for support as well as exercise purposes.

15 In Figure 6 is shown the provision of a rowing
16 exercise device coupled to frame 26. The rower's seat 49
17 is slide coupled to a frame 26 and the person performing the
18 rowing exercise sits on seat 49 and utilizes each of the
19 hydraulic lever assemblies 28 as an oar. Footpads 50 are
20 adjustably slide coupled to the top of frame 26 to provide
21 a foot rest for the rower. Frame 26 is to be used for other
22 purposes. Rowing seat 49 is positioned at the left most
23 extreme of frame 26 as depicted in Figure 6. It should be
24 noted here that the details of the rowing machine exerciser
25 shown in Figure 6 might well have been illustrated in the
26 drawing of Figure 5. It was omitted there to enable dis-
27 closure of the details of treadmill 27. Frame 26 is seen
28 in Figures 1, 2 and 5 as being slide coupled to two short
29 lengths 40 of extrusion 38. This coupling between frame 26
30 and lengths 40 of extrusion 38 permits the pivotal coupling
31 of frame 26 to cabinet 21 and also permits adjustment of the
32 height of frame 26 which may be manipulated to permit the
33 exercises to take place on an inclined plane. Cover 26 in
34 Figure 5 is emplaced over the motor 44 and drive 45 and
35 roller 43 when treadmill 27 is in use.

36 If a purchaser of the invention decides to forego
37 the expense of treadmill 27, a modification of frame 26 will

-10-

1
2 provide a skiing type exercise. As seen in Figure 6, a
3 central beam 47 is emplaced along the longitudinal axis
4 of frame 26. Within the two voids within frame 26
5 which thus results, placed, one in each, is a ski pad which
6 is slide coupled to central beam 47 in the interior walls of
7 frame 26. When an exerciser places one foot on each of
8 ski pads 48, he may utilize hydraulic lever assemblies 28
9 as ski poles thereby exercising arm, leg and back muscles.
10 Frame 26 of Figure 6 is coupled to lengths 40 of element 38
11 as depicted in Figure 5 and thus, frame 26 may have its
12 left-most end, as depicted in Figure 6, raised or lowered
13 to provide an incline or a level ski slope for the exerciser
14 to practice on. Depending on which side of the hydraulic
15 lever assemblies 28 the exerciser positions himself, the
16 exerciser has a choice of uphill or downhill ski exercises.

17 It has been found as a practical matter, that ski
18 pads 48 may be employed in lieu of rower seat 49 when the
19 exerciser wishes to perform rowing exercises.

20 One of the hydraulic lever assemblies 28 is shown
21 in greater detail in Figure 7. It comprises a slide plate 51
22 which is coupled to channel D of element 38 of frame 26.
23 The details of this coupling arrangement are illustrated in
24 Figure 12. Locking screw 52 provides frictional engagement
25 between plate 51 and the walls of channel D permitting plate
26 51 to be slide adjusted along the length of frame 26 and
27 locked into position where desired. A riser 53 is pivotally
28 coupled to plate 51 at 60. Riser 53 supports a height
29 adjustable handle 54 which may be locked into position by
30 means of locking adjustment 55. The hydraulic cylinder 56
31 is pivotally coupled to plate 51 at 61. Cylinder shaft 57
32 is removably coupled to riser 53 at 58. A series of coupling
33 points 59 is provided along riser 53 to which cylinder
34 shaft 57 may be coupled. This provides a selectable varia-
35 tion in the resistance experienced by an exerciser utilizing
36 hydraulic lever assembly 28.

37 To place frame 26 in its storage position, rowing

-11-

1
2 seat 49 is slid to the extreme left-hand end, as depicted
3 in Figure 7 and frame 26 is raised to the vertical position
4 illustrated in phantom outline. Without more, hydraulic
5 lever assembly would assume the position illustrated at 62
6 in phantom outline. This would impede storage within cabinet
7 21 and thus, it is necessary that cylinder shaft 47 be first
8 decoupled from riser 43. When so decoupled, hydraulic lever
9 assembly 28 will assume the position shown in phantom out-
10 line at 63. To permit the use of hydraulic lever assemblies
11 24 for various exercises in front of cabinet 21, lever
12 assembly may be rotated to position shown in phantom outline
13 64. In this position, the lever assemblies 28 may be used
14 directly or in association with cords and pulleys or the
15 weight bench.

16 Figure 8 is an end view showing the pair of lever
17 assemblies 28 mounted on frame 26. Handles 54 may be
18 pivotally and lockingly disposed to vertical or horizontal
19 position. The vertical position particularly lends itself
20 for use of the devices as the ski poles when utilized in
21 association with ski pads 48 shown in Figure 6.

22 Various aspects of the invention will now be dis-
23 closed in greater detail for use of understanding the inven-
24 tion and the facility provided by multi-channeled common
25 structural element 38. Figure 9 is a cross sectional detail
26 of the coupling of idler roller 41 of treadmill 27 to frame
27 26. Idler roller 41 is disposed across opposing inner walls
28 of frame 26 where it is mounted on bearings 68 which are
29 coupled to mounting plates 67 emplaced within channels A
30 of extrusions 38 of frame 26. Mounting plate 67 is lockingly
31 positioned in a manner analogous to that disclosed herein-
32 after. The teflon support surface 99 is similarly coupled
33 to opposing interior faces of frame 26 via channel A
34 in each of elements 38 of frame 26. Details of the coupling
35 of support 99 are now shown but are analogous to other
36 coupling methods disclosed hereinafter.

37 The foot rest 50 for the rowing machine exerciser

-12-

is seen to comprise a coupling plate 69 which has a Tee-shaped base 70 for coupling to channel F of extrusion 38. A foot pressure plate 71 is provided to resist the pressure of the rower's foot. A lever lock 72, not shown, but similar in concept to the locking device illustrated in Figure 13, permits the emplacement of the foot pad in the desired position along the length of frame 26.

As illustrated in Figure 6, rowing seat 47 is slidably coupled to frame 26 while straddling frame 26. This is achieved as shown in Figure 11, illustrating a section of extrusion 38 and a section of rowing seat 49. The roller bearing wheel couples seat 49 to channel B of extrusion 38. Two such wheels are emplaced on either side of rowing seat A for coupling to either exterior side of frame 26. Bearing wheels 73 provide a slide coupling of rowing seat 49 to frame 26 as is required for optimum use of the device as a rowing exerciser.

Figure 12 which details the coupling of lever assembly 28 to extrusion 38 of frame 26 has been mentioned earlier in the discussion of Figure 7. The detail of Figure 12 illustrates the manner in which locking screw 52 provides a frictional lock for locking position slide plate 51 along the length of the frame 26.

Figure 13 should be viewed with reference to Figure 2 which shows the hand rings 39 being coupled to hydraulic lever assemblies 28 by means of cords 37 via pulleys 74. Position of pulley 74 may be located anywhere along the length of frame 26 by means of the lock lever coupling illustrated in Figure 13. Here a pressure plate 75, having a threaded tang attached, is coupled to channel G of extrusion 38 of frame 26. When lock lever 78, thread coupled to threaded tang 76, is rotated, pressure is exerted on washer 77; and pressure plate 75 is drawn into frictional contact with the walls of channel G. Thus, pulley 74 may be located as desired anywhere along the length of channel G.

The ski pad 48 of Figure 6 is shown in greater detail

-13-

1
2 in Figure 15. Two angle supports 79 are coupled to a
3 cushioned base 81. A pair of roller wheels 80 are affixed
4 to either of angle supports 79 for coupling to frame 26 or
5 central beam 47 as detailed in Figure 14. Ski pad 48 may
6 traverse the entire length of channel A in which bearing
7 wheel 80 is emplaced. A person may place his feet on each
8 of the cushioned surfaces of each of the ski pads 48 and
9 utilize them for skiing exercises. Or alternately, a person
10 may sit astride both of ski pads 48, Figure 6, and utilize
11 the pair of ski pads as a rowing seat in lieu of using rowing
12 seat 49, illustrated in Figure 6.

13 By utilizing a second frame made up of extrusions 38,
14 a bicycle exercise device may be provided which may be used
15 in conjunction with frame 46. The exercise bike 82 is
16 illustrated in Figure 16. Bike 82 comprises a frame 83
17 fabricated of extrusion elements 38. Bike 82 is assembled
18 in a manner which permits its folding into a small package
19 for storage within cabinet 21. The folded device is shown
20 in Figure 17. A crank and peddle assembly 84 is coupled
21 across the frame. Truss support 86, pivotally coupled at 91
22 to stanchion 85, is slide coupled by means of rollers 90
23 to frame 83. Rollers 90 are emplaced within channels on
24 opposing walls of frame 83 in the manner reminiscent of
25 that shown in Figures 11 to 14 for the rowing seats and
26 ski pads. Locking device 87 inhibits the movement of
27 rollers 90 when the bicycle is in its upraised position as
28 illustrated in Figure 16. When latch 87 is released, supports
29 86 are permitted to slide forward on bearings 90 which causes
30 stanchion 85 to rotate about a crank 84 so as to lie close
31 to frame 83. When so rotated, the bike may be stored
32 readily within cabinet 21. One end of frame 83 is pivotally
33 coupled at 88 to a section 89 of extrusion 38. The length
34 of element 89 need not be as long as indicated and, where
35 economy dictates, a more conventional means of coupling
36 frame 83 to the cabinet may be provided. Crank 84 drives
37 a sprocket 92 which, via drive belt 93, drives wheel 94 of

-14-

1
2 bicycle 82. A pair of idler rollers set atop frame 26
3 provide for the ready rotation of wheel 94. A friction
4 brake 96 may be adjusted to control the amount of effort
5 required to drive bicycle wheel 94.

6 In the embodiment of the invention wherein treadmill
7 27 is emplaced within frame 26, bicycle wheel 94 may be
8 placed directly in contact with treadmill belt 42 so that
9 the person utilizing bike 82 will drive belt 42, contact
10 drive roller 43, belt drive 45 and motor 44 as a load.
11 Alternatively, an invalid or a person first beginning to
12 exercise on bicycle 82, may activate motor 44 of treadmill
13 27 and permit the treadmill to drive wheel 94 of bike 82
14 and thus cause the crank 84 to be driven, moving the person's
15 legs in response thereto.

16 Bicycle 82 utilizes hydraulic lever assemblies 28
17 as a handle bar assembly for use by the person riding bike
18 82. Actuation of the hydraulic lever assemblies 28 provides
19 added exercise benefits to the rider of bike 82.

20 Figure 18 is a side view of cabinet 21 with the
21 equipment stored within and the cabinet doors 22 and 23
22 closed. Bicycle frame 82 is rotated upwards and locked in
23 position within cabinet 21. Thereafter, frame 26 is rotated
24 upwardly and locked in position within cabinet 21. The
25 doors are then closed and the cabinet provides an appearance
26 to complement the decor of the room in which the exercise
27 system has been utilized.

28 Electronic monitoring is provided by monitor and
29 control 97 which provides a read out of pulse, elapsed time,
30 mileage and speed. An infinitely variable speed control
31 for treadmill drive motor 44 is also provided in monitor and
32 control 97. A storage container 98 provides convenient
33 storage of the pulse monitoring cables.

34 To this point, the invention has been disclosed in
35 an embodiment intended for housing in a special cabinet
36 provided with the exercise system. However, an embodiment of
37 the invention, made possible by use of the common linear

-15-

1
2 structural element, provides a plurality of exercise devices
3 in a configuration which may be readily stored in an existing
4 cabinet or a convenient closet within the home. This free
5 standing embodiment of the invention is shown in Figures 19
6 through 21.

7 In Figure 6 is shown a rectangular frame 26 with
8 a central beam 47 similar to the frame shown in Figure 19.
9 Hydraulic resistance units are adjustably coupled to frame
10 26 in the manner earlier disclosed and as illustrated in the
11 details of Figure 12. Slide pads 48 are coupled to the
12 interior walls of frame 26 in the manner earlier disclosed
13 with respect to Figure 14. With handles 54 disposed in the
14 vertical position, as indicated in Figure 19, the device
15 functions as a skiing exerciser when the person utilizing
16 the invention places his feet on pads 48 and grasps handles
17 54 in the manner in which ski poles are grasped. A leg
18 arrangement 35 is provided so that uphill, skiing exercises
19 may be simulated. Leg 38 here comprises support elements
20 101, 102 and 103 pivotally coupled by pivot pin 104 and
21 rotatingly and slide coupled to frame 26 to provide the user
22 a choice of level or uphill skiing exercise. A similar leg
23 arrangement, not indicated in Figure 19, is provided to the
24 left of the illustration of Figure 19 to provide the user
25 with the choice of uphill or downhill skiing exercise.

26 By releasing lock screws 52, handles 54 may be
27 rotated to a horizontal position, openings 105 being provided
28 in the base of handle 54 to accomodate the alternate vertical
29 and horizontal positioning of handle 54 on hydraulic resis-
30 tance levers 28.

31 In the illustration of Figure 20, handles 54 have
32 been rotated to the horizontal position to serve as the
33 means for grasping hydraulic resistance lever 28 when the
34 invention is used as a rowing exerciser. When so employed,
35 pads 48 are placed adjacent to one another and the person
36 performing the exercises sits on both pads 48. A bar 33,
37 which will be seen to also function as an aid in performing

-16-

1
2 leg lift exercises, is emplaced within supports 106, which
3 supports are slide coupled to frame 26 in a manner reminis-
4 cent of the arrangement illustrated in Figure 13. Locking
5 screws 107 are provided to lock supports 106 in position.
6 Supports 106 may be positioned along the length of frame
7 26 as may be desired by the person utilizing the invention.
8 When utilized as a rowing machine, as illustrated in Figure
9 20, bar 33 provides a foot rest as a counter-resistance
10 element for use by the person manipulating hydraulic
11 resistance levers 28 in a manner similar to that of rowing
12 a boat.

13 Both of legs 35 are illustrated in Figure 20.

14 In Figure 21, the arms of hydraulic resistance units
15 28 have been rotated downward to lie in a plane essentially
16 parallel to the longitudinal axis of frame 26. Bar 33 has
17 been removed from supports 106 and captivated by handles
18 54 of hydraulic resistance levers 28.

19 The manner in which handles 54 are inserted within
20 bar 33 is illustrated in the exploded view of Figure 22.
21 Handles 54 are removed from adjustable height lever arms 53
22 and the handles inserted into bar 33. Handles 54 are again
23 placed on arms 53 and locked in place by locking screws 52.
24 The invention is now configured for use as a leg lift bench.
25 Pads 48 are placed adjacent each other and positioned under
26 the buttocks of the person performing the leg lift exercise
27 or under the small of his back as may be desired. The person
28 performing the exercises may hook his feet below bar 33 to
29 utilize the device for leg lifting exercises. With arms of
30 hydraulic resistance units 28 raised, the person may place his
31 feet on bar 33 to perform leg pushing exercises. Legs 35
32 may be individually adjusted so that frame 26 may be utilized
33 as an inclined board. It will be readily understood that the
34 use of frame 26 as an inclined board. exerciser may also be
35 achieved by removal of bar 33 and the actuation of hydraulic
36 resistance units 28 by hand grasping handles 54 to provide
37 an exercise for the upper portions of the body.

-17-

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For purposes of definition, "hydraulic resistance means" as used herein, is intended to encompass fluid, air, or spring loaded means adjustable for providing a selectedly variable degree of resistance to the person utilizing said means for exercise purposes.

What has been disclosed is a multiple device exercise system. A common linear structural element makes possible the incorporation of a multiplicity of exercise devices as part of the exercise system housed within a cabinet or readily storable in a closet. The structural element comprises an extrusion with a plurality of longitudinal channels thereabout for accepting wheels, slide or locking plates or similar devices for coupling various exercise devices to the structural element. The variety and multiplicity of such linear channels permits a dynamic relationship to exist among an infinite number of positioning points of coupling of the various exercise elements to the structural element. The diversity of coupling arrangements permitted by use of this common structural element provides an improvement in a home exercise system in that a greater number and variety of exercise devices may be provided for use within the home in a manner which does not impose itself disadvantageously upon the living space of the home and which does not detract from the decor of the home.

Those skilled in the art will conceive of other embodiments of the invention which may be drawn from the disclosure herein. To the extent that such other embodiments are so drawn, it is intended that they shall fall within the ambit of protection provided by the claims herein.

Having described my invention in the foregoing description and drawings in such a clear and concise manner that those skilled in the art may readily understand and practice the invention, that which I claim is:

-18-

CLAIMS

1. In an exercise system comprising a plurality of exercise equipment, the improvement making it possible to readily store and utilize such a multiplicity of equipment comprising:

a common linear structural element having a plurality of longitudinally disposed channels communicating with the exterior of said element for accepting at least one of wheels, slide plates and locking plates within selected ones of said channels, said common structural element being employed as a coupling device for the cooperative assembly of said plurality of exercise equipment and the storing of same, said plurality of longitudinally disposed channels permitting the infinitally variable noninterfering longitudinal selective displacement of the points at which a plurality of said exercise devices are coupled to a given element.

2. The improvement of Claim 1 further comprising:

a rectangular frame comprised of at least two lengths of said common structural element to provide a plurality of said longitudinal channels in opposing interior walls of said frame for coupling exercise devices across opposed interior walls of said frame.

3. The improvement of Claim 2 further comprising:

cabinet means for housing said rectangular frame; and

coupling means for pivotally coupling said rectangular frame to said cabinet to provide in cooperation with said cabinet, partial support for said rectangular frame and for rotating said frame for storage within said cabinet.

-19-

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2 4. The improvement of Claim 3 wherein said rec-
3 tangular frame has a bicycle exercise device coupled thereto
4 said bicycle exerciser device comprising:

5 a crank and sprocket drive coupled across
6 opposing inner walls of said frame;

7 a seat support stanchion pivotally coupled
8 to the crank of said drive;

9 a truss support pivotally coupled to
10 said stanchion and slide coupled to opposing
11 interior walls of said frame; and

12 a belt driven wheel, belt coupled to the
13 sprocket of said drive and coupled to opposing
14 interior walls of said frame,

15 said pivotal and slide couplings of the members permitting
16 the bicycle exercise device to be folded down to a relatively
17 flat package coupled to and storable within said cabinet.

18 5. The improvement of Claim 3 further comprising
19 hydraulic resistance means coupled to said frame to be
20 used in association with exercise devices coupled across
21 opposed interior walls of said frame.

22 6. The improvement of Claim 5 further comprising:
23 pulley means lockingly, slidably coupled to said frame;
24 and cord means coupled through a said pulley means to said
25 hydraulic resistance means for communicating a resistive
26 force from said hydraulic resistance means along said cord
27 means and through said pulley means, said cord means
28 thereby providing an exercise device.

29 7. The improvement of Claim 3, said frame being
30 pivotally coupled to said cabinet for storage therein and
31 further comprising a weight bench pivotally coupled at one
32 end within said frame and across opposing walls thereof for
33 use as an exercise device when said frame is stored within
34 said cabinet.

35 8. The improvement of Claim 7 further comprising
36 hydraulic resistance means coupled to said frame for use in
37 association with exercises performed on said weight bench.

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9. The improvement of Claim 8 further comprising:
pulley means lockingly, slidingly coupled to said frame;
and cord means coupled through said pulley means to said
hydraulic resistance means for communicating a resistive
force from said hydraulic resistance means along said cord
means and through said pulley means, said cord means thereby
providing an exercise device.

10. The improvement of Claim 3 wherein said rectangular frame comprises a first such frame having a bicycle exercise device coupled thereto and a second such frame cooperating therewith and having a treadmill exerciser device coupled thereto, said bicycle exerciser device comprising:

a crank and sprocket drive coupled
across opposing inner walls of said first
frame;

a seat support stanchion pivotally
coupled to the crank of said drive;

a truss support pivotally coupled to
said stanchion and slide coupled to
opposing interior walls of said first frame,

said pivotal and slide couplings of the members permitting
the bicycle exercise device to be folded down to a relatively
flat package coupled to and storable within said cabinet;
said treadmill exerciser device comprising:

a pair of idler rollers disposed
in spaced apart relationship each
coupled across opposing inner walls
of said second frame;

a low-friction surfaced support
coupled across opposing inner walls
of said second frame between said
pair of idler rollers; and

a treadmill belt emplaced about said pair
of idler rollers and supported in part by said
low-friction surfaced support, said belt driven

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wheel of said bicycle exerciser being dis-
posable for contact with the surface of said
treadmill belt when said bicycle exerciser
is in use, said second frame being pivotally
coupled to said cabinet for storage therein.

11. The improvement of Claim 42 further comprising
a weight bench emplaced below said treadmill exerciser
device and pivotally coupled at one end of said second frame
and across opposing walls thereof for use as an exercise
device when said second frame is stored within said cabinet.

12. The improvement of Claim 11 further comprising:
hydraulic resistance means coupled to said second frame for
use in association with exercises performed on said weight
bench.

13. The improvement of Claim 12 further comprising:
pulley means, lockingly, slidingly coupled to said frame;
and cord means coupled through said pulley means to said
hydraulic resistance means for communicating a resistive
force from said hydraulic resistance means along said cord
means and through said pulley means, said cord means thereby
providing an exercise device.

14. The improvement of Claim 3 wherein said
rectangular frame has coupled thereto a treadmill exerciser
device said treadmill exerciser device comprising:

a pair of idler rollers disposed in spaced
apart relationship each coupled across
opposing inner walls of said frame;

a low-friction surfaced support coupled
across opposing inner walls of said frame
between said pair of idler rollers; and

a treadmill belt emplaced about said
pair of idler rollers and supported in part
by said low-friction surfaced support,
said frame being pivotally coupled to said cabinet for
storage therein.

15. The improvement of Claim 43 further comprising

-22-

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2 a weight bench emplaced below said treadmill exerciser device,
3 pivotally coupled at one end of said frame and across oppo-
4 sing walls thereof for use as an exercise device when said
5 frame is stored within said cabinet.

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16. The improvement of Claim 15 further comprising
7 hydraulic resistance means coupled to said frame for use in
8 association with exercises performed on said weight bench.

9

17. The improvement of Claim 16 further comprising:
10 pulley means lockingly, slidably coupled to said frame;
11 and cord means coupled through said pulley means to said
12 hydraulic resistance means for communicating a resistive
13 force from said hydraulic resistance means along said cord
14 means and through said pulley means, said cord means thereby
15 providing an exercise device.

16

18. The improvement of Claim 17 comprising a second
17 said rectangular frame having a bicycle exercise device
18 coupled thereto said bicycle exerciser device comprising:

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a crank and sprocket drive coupled
20 across opposing inner walls of said second
21 frame;

22

a seat support stanchion pivotally
23 coupled to the crank of said drive;

24

a truss support pivotally coupled to
25 said stanchion and slide coupled to opposing
26 interior walls of said second frame; and

27

a belt driven wheel, belt coupled to the
28 sprocket of said drive and coupled to opposing
29 interior walls of said second frame,

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said pivotal and slide couplings of the members permitting
31 the bicycle exercise device to be folded down to a relatively
32 flat package coupled to and storable within said cabinet.

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19. The improvement of Claim 3 further comprising
34 an additional length of said common structural emplaced within
35 said rectangular frame along the longitudinal axis thereof
36 to provide two pair of opposed longitudinal interior walls
37 each wall with a plurality of said longitudinal channels to

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2 which exercise devices may be coupled from one opposing
3 interior wall to another.

4 20. The improvement of Claim 19 further comprising
5 first ski pad means slidably coupled across a first pair
6 of said opposing interior walls; and second ski pad means
7 slidably coupled across a second pair of said opposing
8 interior walls for providing a skiing-like exercise device.

9 21. The improvement of Claim 20 further comprising
10 hydraulic resistance means coupled to said frame to be used
11 in association with exercise devices coupled to said frame.

12 22. The improvement of Claim 21 further comprising
13 a weight bench emplaced within said frame and below said
14 additional length of said common structural element, pivotally
15 coupled at one end of said frame for use as an exercise
16 device when said frame is stored within said cabinet.

17 23. The improvement of Claim 22 further comprising:
18 pulley means lockingly, slidably coupled to said frame;
19 and cord means coupled through said pulley means to said
20 hydraulic resistance means for communicating a resistive
21 force from said hydraulic resistance means along said cord
22 means and through said pulley means, said cord means thereby
23 providing an exercise device.

24 24. The improvement of Claim 23 comprising a
25 second said rectangular frame having a bicycle exercise
26 device coupled thereto said bicycle exerciser device
27 comprising:

28 a crank and sprocket drive coupled
29 across opposing inner walls of said second
30 frame;

31 a seat support stanchion pivotally coupled
32 to the crank of said drive;

33 a truss support pivotally coupled to said
34 stanchion and slide coupled to opposing
35 interior walls of said second frame; and

36 a belt driven wheel, belt coupled to
37 the sprocket of said drive and coupled to

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opposing interior walls of said second frame,
said pivotal and slide couplings of the members permitting
the bicycle exercise device to be folded down to a relatively
flat package coupled to and storable within said cabinet.

25. The improvement of Claim 1 further comprising
a rectangular frame comprised of at least two lengths of
said common structural element to provide a plurality of said
longitudinal channels in opposing outer walls of said frame
for coupling exercise devices across said frame to opposed
exterior walls thereof.

26. The improvement of Claim 25 further comprising
hydraulic resistance means coupled to said frame to be used
in association with exercise devices coupled across said
frame to exposed exterior walls thereof.

27. The improvement of Claim 26 further comprising
seating means slidably coupled across said frame and foot
pad means coupled to said frame said seating means and said
foot pad means, in cooperation with said hydraulic resistance
means providing a rowing exercise device.

28. The improvement of Claim 27 further comprising:
cabinet means for housing said rectangular
frame; and

coupling means for pivotally coupling said
rectangular frame to said cabinet to provide
in cooperation with said cabinet, partial support
for said rectangular frame and for rotating
said frame for storage within said cabinet.

29. The improvement of Claim 28, said frame being
pivotally coupled to said cabinet for storage therein and
further comprising a weight bench pivotally coupled at one
end of said frame for use as an exercise device when said
frame is stored within said cabinet.

30. The improvement of Claim 29 further comprising
pulley means lockingly, slidably coupled to said frame;
and cord means coupled through said pulley means to said
hydraulic resistance means for communicating a resistive

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2 force from said hydraulic resistance means along said cord
3 means and through said pulley means, said cord means thereby
4 providing an exercise device.

5 31. The improvement of Claim 30 comprising a second
6 said rectangular frame having a bicycle exercise device
7 coupled thereto said bicycle exercise device comprising:

8 a crank and sprocket drive coupled
9 across opposing inner walls of said second frame;
10 a seat support stanchion pivotally
11 coupled to the crank of said drive;
12 a truss support pivotally coupled to
13 said stanchion and slide coupled to opposing
14 interior walls of said second frame; and
15 a belt driven wheel, belt coupled to the
16 sprocket of said drive and coupled to opposing
17 interior walls of said second frame,
18 said pivotal and slide couplings of the members permitting
19 the bicycle exercise device to be folded down to a relatively
20 flat package coupled to and storable within said cabinet.

21 32. The improvement of Claim 1 further comprising:
22 a rectangular frame comprised of at least two or more lengths
23 of said common structural element to provide a plurality of
24 said longitudinal channels in opposing interior walls of
25 said frame for coupling exercise devices across opposed
26 interior walls of said frame, and further providing a
27 plurality of said longitudinal channels in opposing outer
28 walls of said frame for coupling exercise devices across
29 said frame to opposed exterior walls thereof.

30 33. The improvement of Claim 1 further comprising:
31 a rectangular frame comprised of two outer lengths and a
32 central length of said common structural element each said
33 common structural element length being generally parallel to
34 the longitudinal axis of said rectangular frame, said frame
35 providing a plurality of longitudinal channels in opposing
36 interior walls thereof for coupling exercise devices across
37 said opposed interior walls and further providing a plurality

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2 of longitudinal channels in the exterior walls of said frame
3 for further coupling exercise devices to said frame.

4 34. The improvement of Claim 33 further comprising
5 resistance means lockingly, slidably coupled to channels
6 of said frame for providing a resistive force exercise
7 device.

8 35. The improvement of Claim 34 further comprising
9 a first pad means slidably coupled across a first pair of
10 opposed interior walls of said frame; and a second pad means
11 slidably coupled across a second pair of opposed interior
12 walls of said frame.

13 36. The improvement of Claim 35 further comprising
14 means for grasping said resistance means in the manner of
15 ski poles, said resistance means cooperating with said first
16 and second pad means to provide a skiing type exerciser.

17 37. The improvement of Claim 35 further comprising
18 means for grasping said resistance means in the manner of
19 oars, said resistance means cooperating with said first and
20 second pad means to provide a rowing type exerciser.

21 38. The improvement of Claim 34 further comprising
22 means for coupling a person's legs to said resistance means,
23 said resistance means cooperating with said frame to provide
24 a leg lift bench exerciser.

25 39. The improvement of Claim 35 wherein said
26 resistance means further comprise at least one of means for
27 hand actuation and means for leg actuation whereby said
28 improvement selectedly provides at least one of a skiing
29 type exerciser, a rowing type exerciser, and a leg lift
30 bench exerciser.

31 40. The improvement of Claim 39 wherein said
32 frame further comprises means for inclining said frame so
33 that exercises may be performed thereon on an inclined
34 plane.

35 41. The improvement of Claim 3 further comprising
36 a bicycle exercise device coupled to said rectangular frame.

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2 42. The improvement of Claim 3 wherein said
3 rectangular frame comprises a first such frame having a
4 bicycle device coupled thereto and a second such frame
5 cooperating therewith and having a treadmill exerciser
6 device coupled thereto.

7 43. The improvement of Claim 3 wherein said rec-
8 tangular frame has coupled thereto a treadmill exerciser
9 device.

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FIG. 1

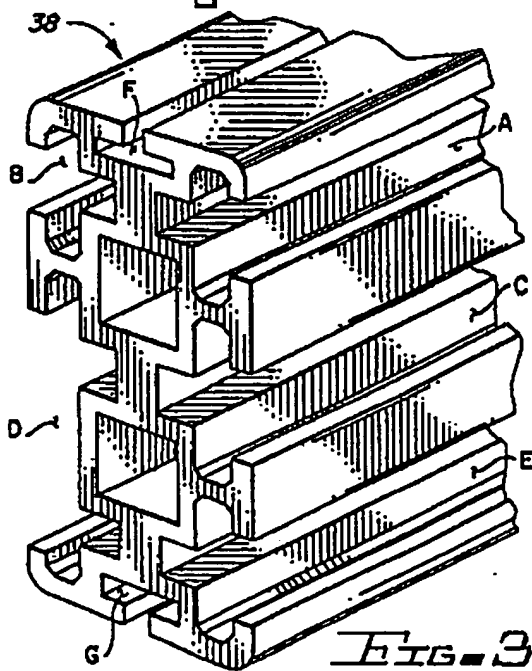
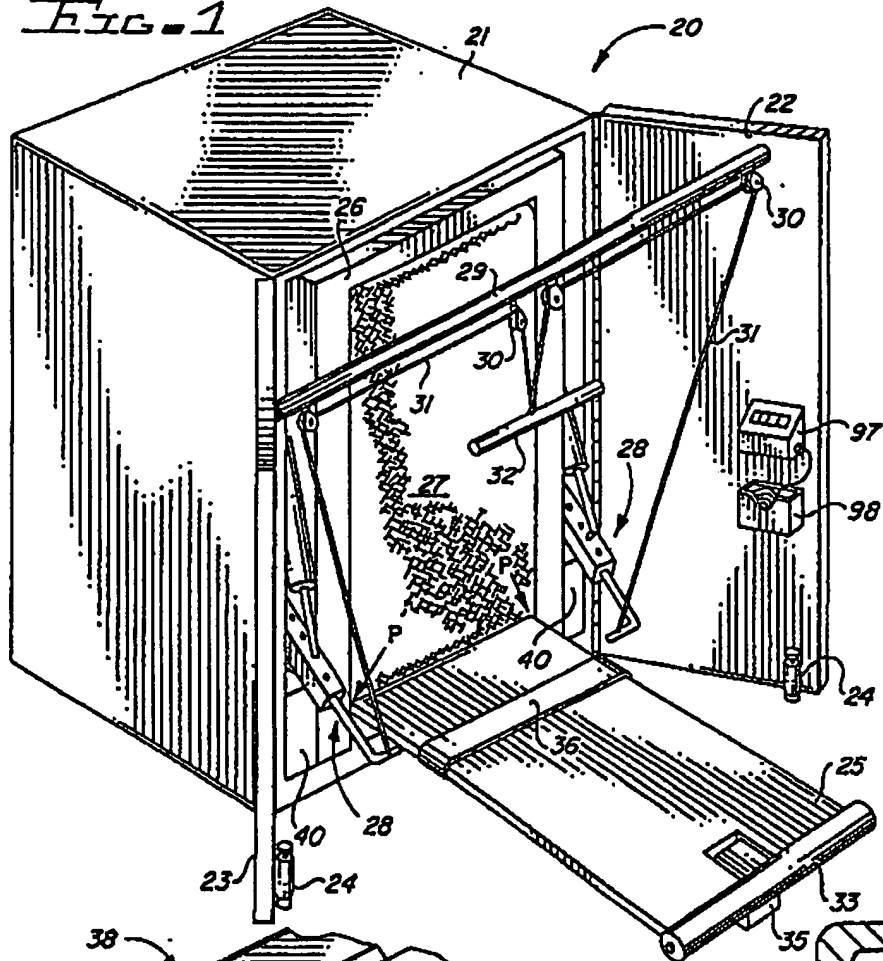


FIG. 3

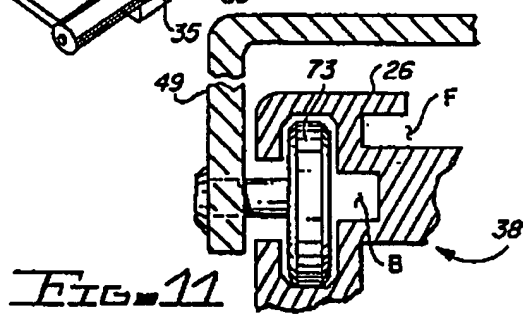


FIG. 11

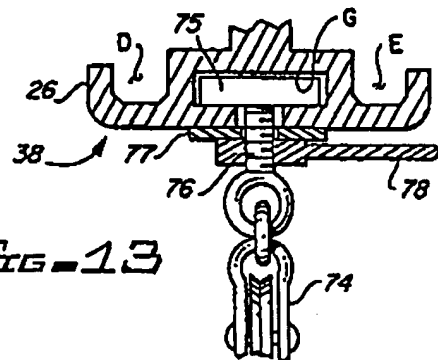


FIG. 13

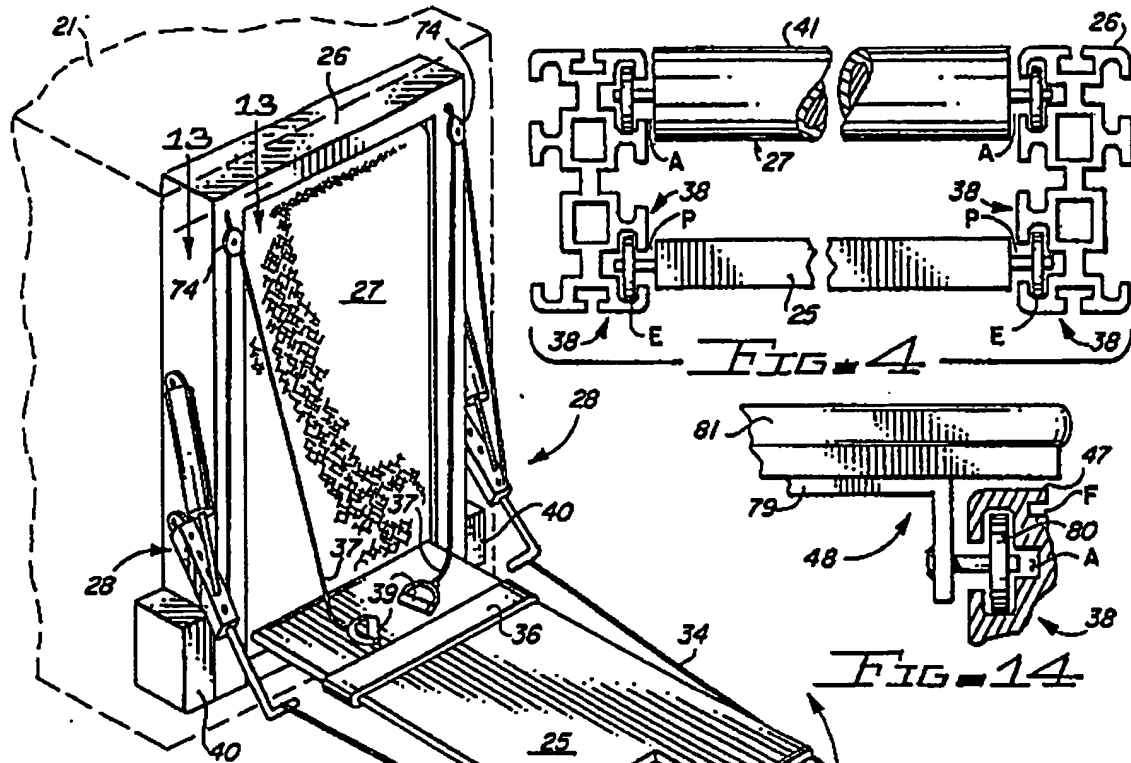


FIG. 2

FIG. 5

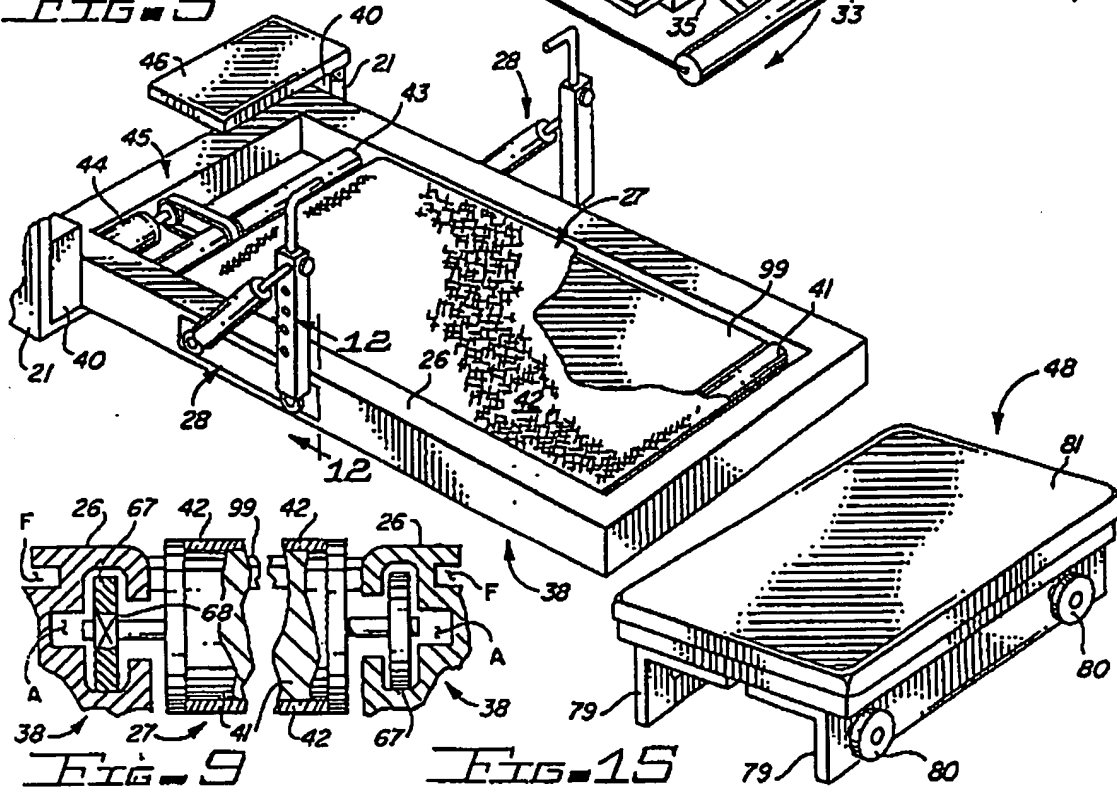
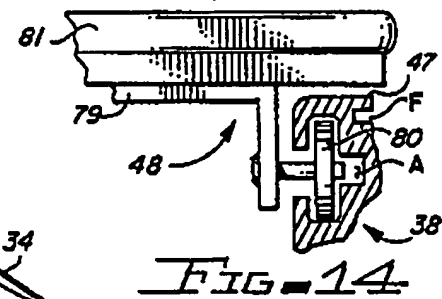
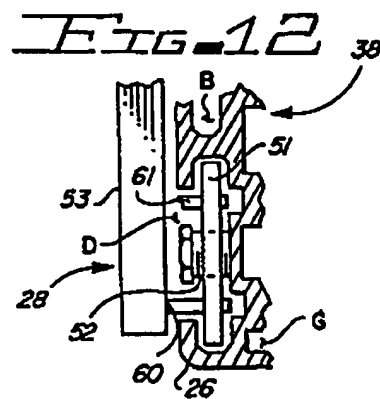
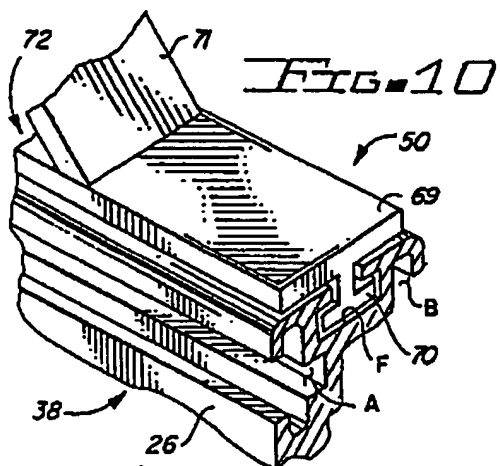
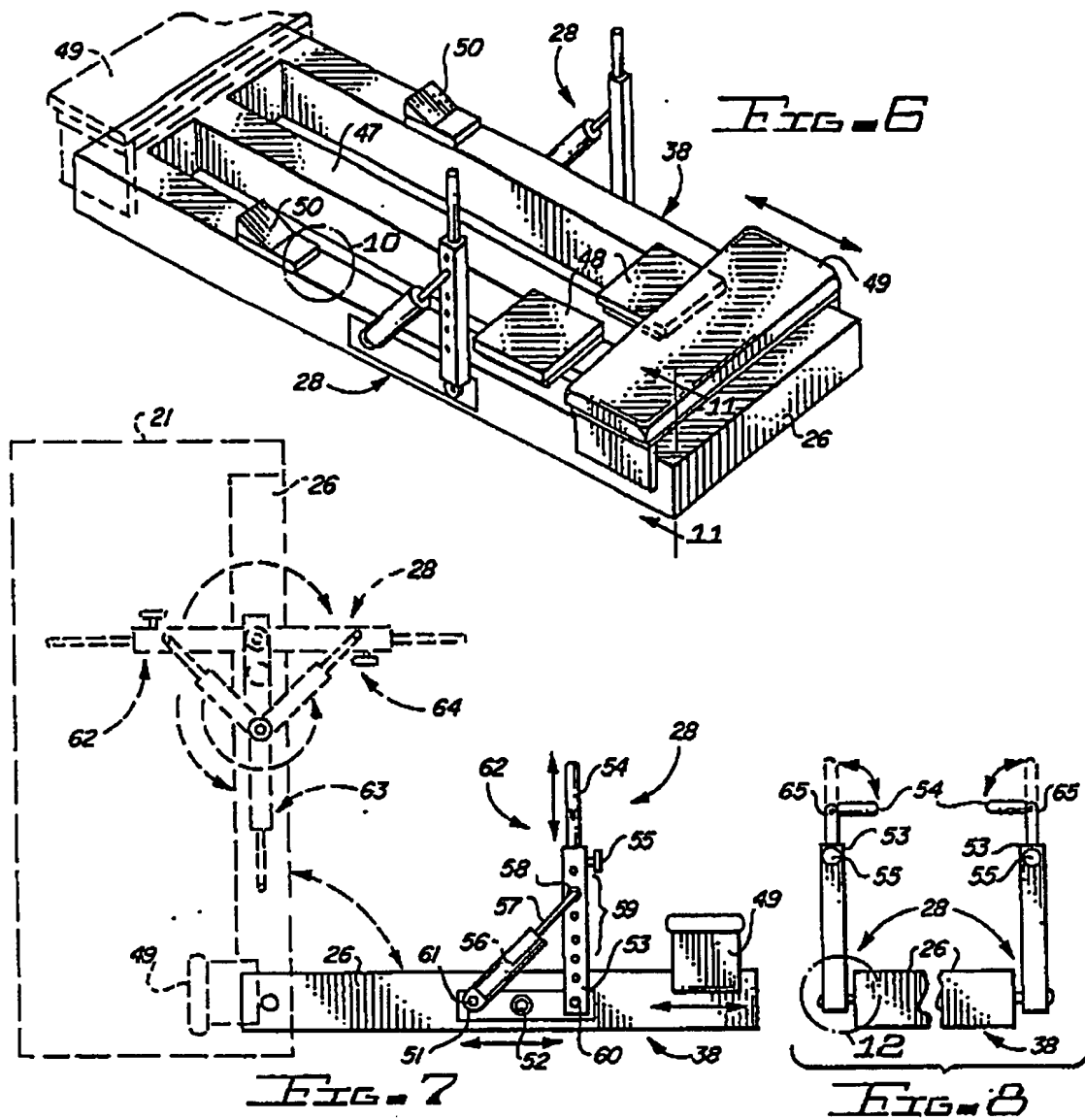
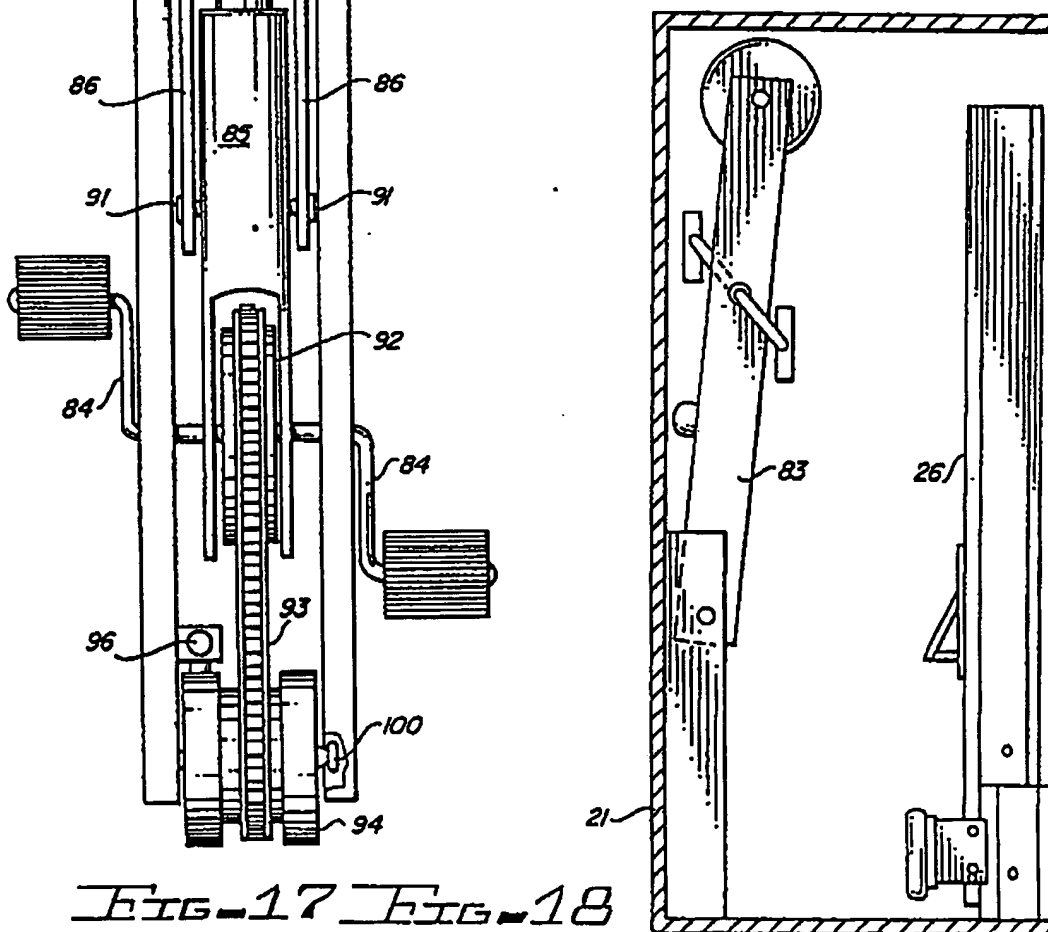
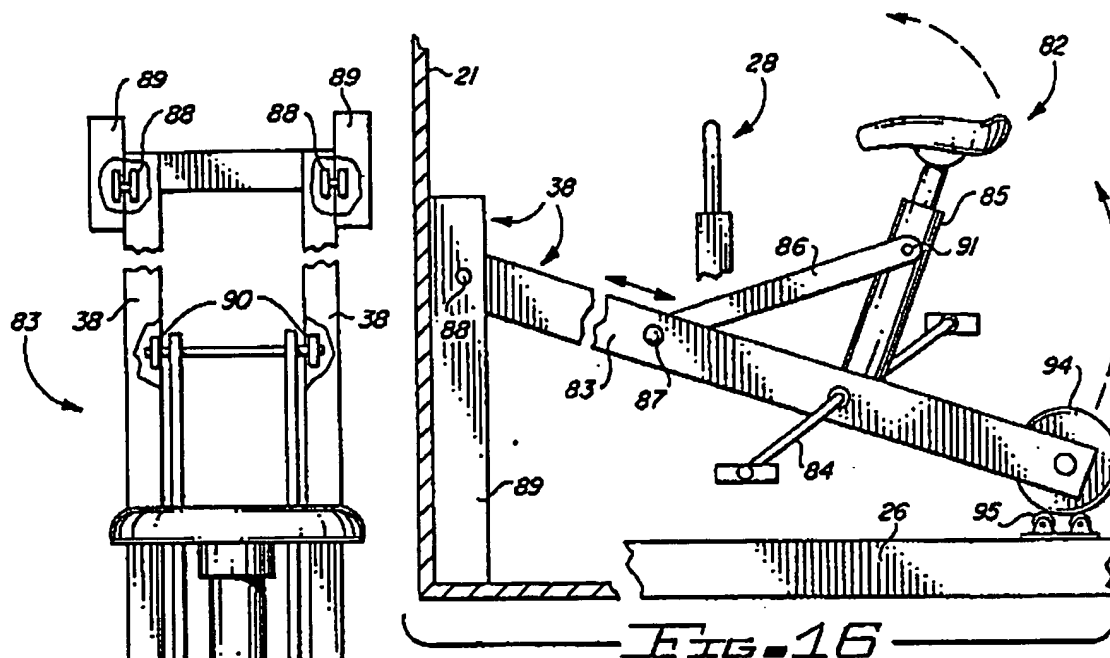


FIG. 15







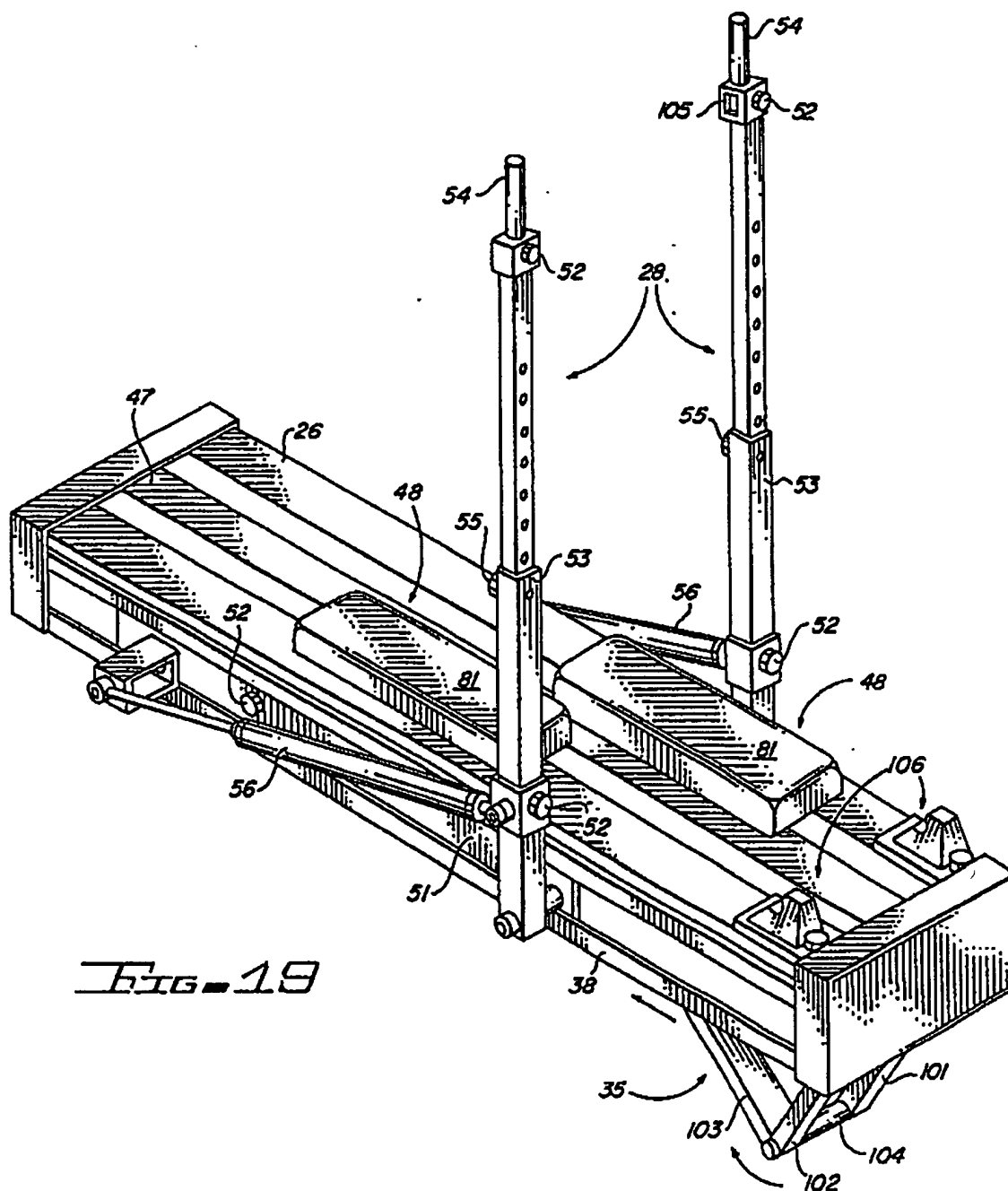
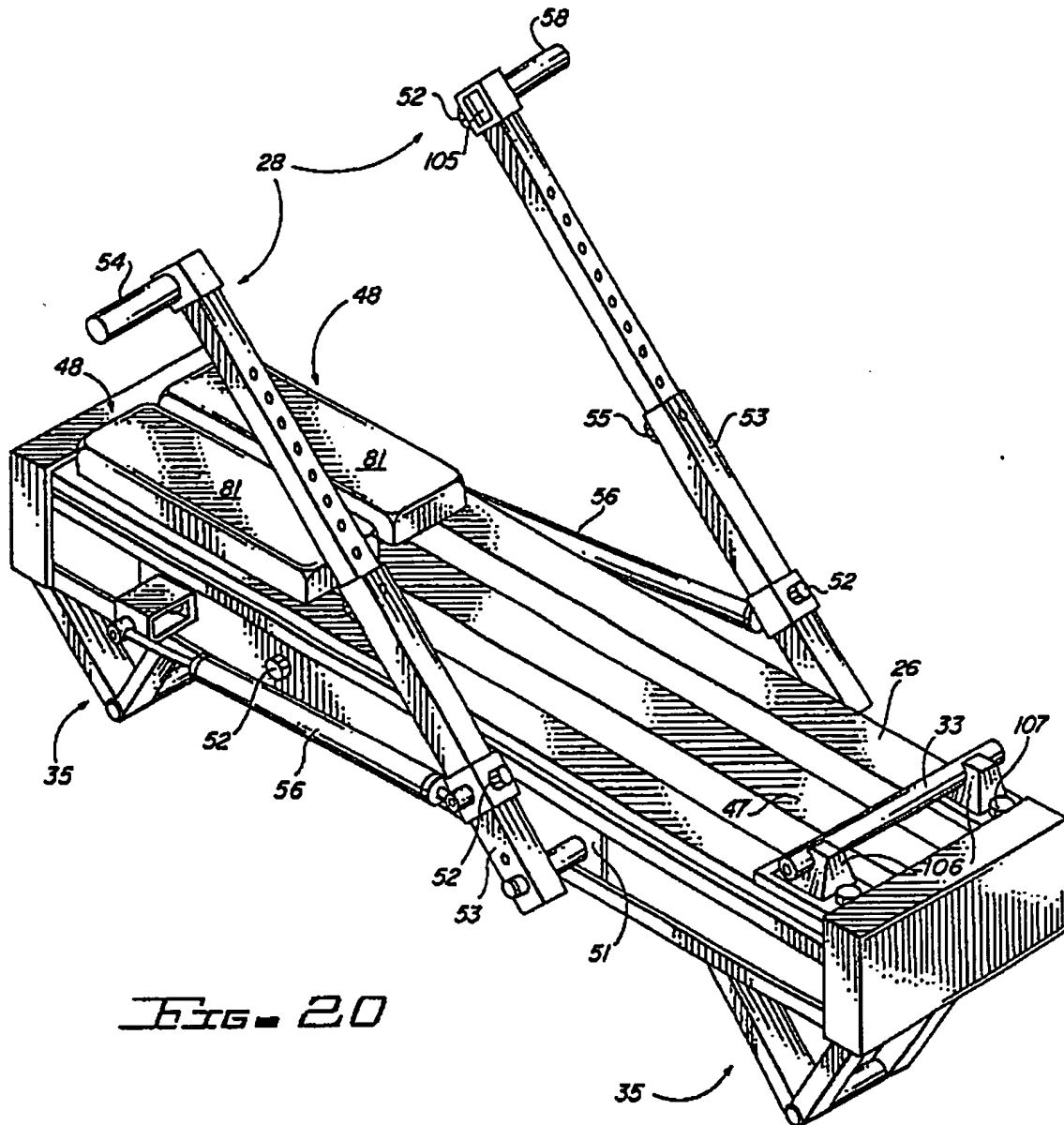
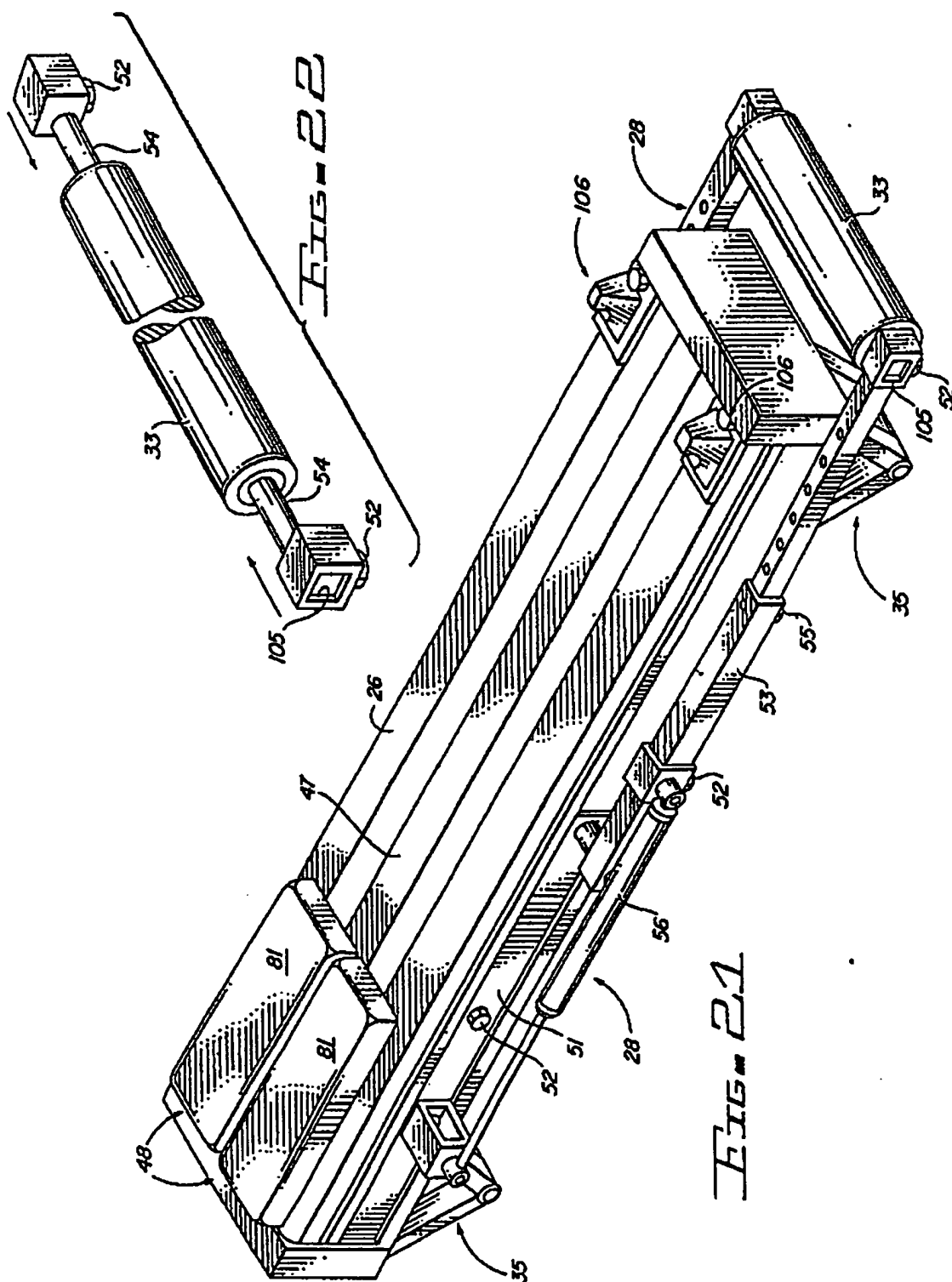


Fig. 19





INTERNATIONAL SEARCH REPORT

International Application No **PCT/US85/01324**

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ²		
According to International Patent Classification (IPC) or to both National Classification and IPC Int. Cl. A63B 21/00 US Cl. 272/130, 143, 134, 72, 73, 97		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁴		
Classification System	Classification Symbols	
U.S.	272/130, 143, 134, 72, 73, 97, 113, 117	
Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched ⁵		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴		
Category ⁶	Citation of Document, ¹⁵ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸
Y	US 4,026,545 31 May 1977	1-42
Y	US 2,632,645 24 March 1953	3-10, 14, 19-24, 41-43, 29, 30, 31
Y	US 382,440 8 May 1888	3-10, 14, 19-24, 41-43
Y	US 554,754 1 st February 1896	4, 10, 18, 24, 31, 41-43
Y	US 3,266,801 16 August 1966	5, 6, 37, 39, 40
Y	US 4,477,071 16 October 1984	8, 9, 12, 13, 16, 17, 26-31
(con'td)		
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>¹⁶ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search ¹	Date of Mailing of this International Search Report ²	
12-16-85	26 DEC 1985	
International Searching Authority ³	Signature of Authorized Officer ¹⁹	
ISA/US		

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, ¹⁶ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸
Y	US 4,066,257 3 January 1978	14,15-18
Y, P	US 4,529,194 16 July 1985	20-24, 35-40
Y	US 4,047,715 13 September 1977	27-31
Y	US 4,429,871 7 February 1984	38,39

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